AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application. Kindly add new claims 28 through 47 as follows:

LISTING OF CLAIMS

1. (Original) A motor vehicle comprising:

an axle assembly;

a plurality of sensors adapted to send signals to a controller, said controller adapted to determine the rotational parameters of an axle within said axle assembly; and

an exciter ring assembly including an exciter ring coupled to rotate with said axle, said exciter ring having an annular lip protruding about the circumference of a first end of said ring, said ring having an aperture to accommodate the shaft of said axle, said ring having teeth extending axially along a second end of said ring, said sensor positioned to detect said teeth of said exciter ring.

an outer member concentric to said lip, adapted to restrain the radially projecting annular surfaces of either annular end of said lip, said outer member fixed within said axle assembly.

2. (Original) The vehicle of Claim 1 wherein an elastomer insert is attached to the interior surface of said exciter ring and contacting said axle to restrain the relative rotation between said exciter ring and said axle.

3. (Original) The vehicle of Claim 2 wherein said exciter ring includes a means for promoting oil flow within an axle tube in the region of said exciter ring assembly including channels within the interior surface of said elastomer insert to enable oil to pass from a first axial end of said exciter ring assembly to a second axial end of said exciter ring assembly.

4. (Original) The vehicle of Claim 1 wherein said outer member includes recesses in the circumferential surface, said recesses enable oil flow past said exciter ring assembly.

5. (Original) The vehicle of Claim 1 wherein said outer member includes cutouts in the circumferential surface, said cutouts enable oil flow past said exciter ring assembly.

6. (Original) An axle assembly comprising:

an axle tube;

an axle passing through a section of said axle tube;

an inner bore within said axle tube;

a sensing means for detecting rotational parameters of said axle; and

an exciter ring assembly press fit into said inner bore comprising:

an exciter ring with an annular lip protruding about the circumference of a first end of said exciter ring, said exciter ring having a coaxial bore to accommodate the diameter of said axle, said exciter ring having axial teeth extending radially along a

second end of said exciter ring, said sensing means positioned to detect said teeth of said exciter ring; and

an outer member concentric to said lip, adapted to restrain the radially projecting annular surfaces of either annular end of said lip, said outer member adapted to an interference fit with said inner bore.

7. (Original) The axle assembly of Claim 6 wherein an elastomer insert is attached to the interior surface of said exciter ring and contacting said axle to restrain the relative rotation between said exciter ring and said axle.

8. (Original) The axle assembly of Claim 7 wherein said exciter ring includes a means for enabling oil flow within said axle tube in the region of said exciter ring assembly including channels within said interior surface of said elastomer insert to enable oil to pass from a first axial end of said exciter ring assembly to a second axial end of said exciter ring assembly.

9. (Original) The axle assembly of Claim 6 wherein said outer member includes recesses in the circumferential surface, said recesses enable oil flow past said exciter ring assembly.

10. (Original) The axle assembly of Claim 6 wherein said outer member includes cutouts in the circumferential surface, said cutouts enable oil flow past said exciter ring assembly.

11. (Original) An exciter ring assembly comprising:

an exciter ring with an annular lip protruding about the circumference of a first end of said exciter ring, said exciter ring having a coaxial bore to accommodate the diameter of an axle, said exciter ring having radial teeth extending axially along a second end of said exciter ring, said lip having a first radially projecting annular end surface and a second radially projecting annular end surface; and

an outer member concentric to said lip, said outer member restraining said first and second annular surfaces of said lip, said outer member adapted to be restrained relative to rotation of said axle.

12. (Original) The exciter ring assembly of Claim 11 wherein an elastomer insert is attached to the interior surface of said exciter ring and contacting said axle to restrain the relative rotation between said exciter ring and said axle.

13. (Original) The exciter ring assembly of Claim 12 wherein said exciter ring includes a means for promoting oil flow within an axle tube in the region of said exciter ring assembly comprising channels within said interior surface of said elastomer insert to enable oil to pass from a first axial end of said exciter ring assembly to a second axial end of said exciter ring assembly.

14. (Original) The exciter ring assembly of Claim 11 wherein said outer member includes recesses in the circumferential surface, said recesses enable oil flow past said exciter ring assembly.

15. (Original) The exciter ring assembly of Claim 11 wherein said outer member includes cutouts in the circumferential surface, said cutouts enable oil flow past said exciter ring assembly.

16. (Original) The exciter ring assembly of Claim 11 including a spacer located within said outer member.

17. (Original) The exciter ring assembly of Claim 16 wherein said spacer includes outside apertures to enable oil flow.

18. (Original) The exciter ring assembly of Claim 16 wherein said spacer includes inside apertures to enable oil flow.

19. (Original) An exciter ring comprising an annular lip protruding about the circumference of a first end of said exciter ring, said exciter ring having a coaxial bore to accommodate the diameter of an axle, said exciter ring having radial teeth extending axially along a second end of said exciter ring, said lip having a first annular end surface and a second annular end surface and a outer circumferential surface.

20. (Original) The exciter ring of Claim 19 wherein said annular lip is rotatably coupled with an outer member, said outer member restraining axial movement of said exciter ring, said outer member having an axial length less than said exciter ring.

21. (Original) The exciter ring of Claim 19 wherein an elastomer insert is attached to the interior surface of said exciter ring and contacting said axle to restrain relative rotation between said exciter ring and said axle.

22. (Original) The exciter ring of Claim 21 wherein said exciter ring includes a means for promoting oil flow within an axle tube in the region of said exciter ring comprising channels within said elastomer insert to enable oil to pass from a first end of said exciter ring to a second end of said exciter ring.

23. (Original) The outer member of Claim 20 wherein said outer member includes recesses in said outer circumferential surface, said recesses enable oil flow past said outer member.

24. (Original) The outer member of Claim 20 wherein said outer member includes cutouts in said outer circumferential surface, said cutouts enable oil flow past said outer member.

25. (Original) The exciter ring of Claim 20 including a spacer located within said outer member.

26. (Original) The exciter ring of Claim 25 wherein said spacer includes outside apertures to enable oil flow.

27. (Original) The exciter ring of Claim 25 wherein said spacer includes inside apertures to enable oil flow.

28. (New) A tone ring assembly for use on a rotatable machine part, said assembly including a rotatable tone ring able to generate a varying voltage output when rotated at varying speeds, with a fixed magnetic sensor assembly disposed in facing relation and closely spaced from said tone ring, said rotatable machine part including an axially inner portion and an axially outer portion running in a surrounding bearing unit, said tone ring comprising an axially extending main body portion with a plurality of areas able to generate a voltage output upon rotation, a retainer having at least one radial flange to prevent substantial axial movement of said tone ring, said tone ring including plural axially extending ribs of reduced diameter on its inner diameter for snugly engaging a shaft, and having axial spaces of enlarged diameter between said ribs, thereby affording passages for oil to pass axially through said tone ring assembly.

29. (New) A tone ring assembly as defined in claim 28, wherein said tone ring able to generate a voltage output by rotation comprises a tone ring body which includes a large plurality of axially extending lands and grooves therein.

30. (New) A tone ring assembly as defined in claim 28, wherein said tone ring body includes a radial flange formed on the axially outer end thereof.

31. (New) A tone ring assembly as defined in claim 28, wherein said retainer includes a corrugated outer diameter, whereby oil may pass axially along the outer diameter of said retainer.

32. (New) A tone ring assembly as defined in claim 28, wherein said axially extending ribs on the inner diameter of said tone ring assembly have beveled end portions so as to facilitate installation over an associated axle shaft.

33. (New) A tone ring assembly as defined in claim 28, which further includes a spacer, lying in use between one end of said tone ring and one flange of said retainer, said spacer being made from a low friction material which is also resistant to noise making when in at least occasional contact with said tone ring.

34. (New) A tone ring assembly as defined in claim 33, wherein said spacer is made from a plastic material.

35. (New) A tone ring assembly as defined in claim 30, which further includes a low friction coating material on the axially outermost portion of said radial flange on said tone ring body.

36. (New) A tone ring assembly as defined in claim 33, wherein said spacer is discontinuous at its outer diameter to permit oil flow axially therethrough.

37. (New) A tone ring assembly as defined in claim 28, wherein at least said rib portion of said tone ring is an elastomer that is a blend of NBR and EPDM.

38. (New) A tone ring assembly as defined in claim 28, wherein said ribs on said tone ring comprise at least one elastomer selected from the class consisting of NBR, HNBR, EPDM, AEM and ACM.

39. (New) A tone ring assembly as defined in claim 28, wherein said ribs on said inner diameter of said tone ring are made from a thermoplastic or thermoset material.

40. (New) A tone ring assembly as defined in claim 30, wherein said radial flange of said retainer includes cut-out portions to permit oil to pass therethrough.

41. (New) A tone ring assembly as defined in claim 30, wherein said body has, on said outer flange thereof, a stepped diameter.

42. (New) A tone ring assembly as defined in claim 30, wherein said tone ring further includes an air gap lying between radially opposed portions of said body and said radial flange for allowance of maximum axle shaft deflections without touching the flanges on said retainer.

43. (New) A tone ring assembly as defined in claim 28, which may have one associated axle shaft removed and either that axle shaft or another axle shaft installed into the original tone ring and retainer assembly.

44. (New) A tone ring assembly as defined in claim 30, wherein said tone ring assembly may be installed over an axle shaft and held in place by interference between said tone ring body and said flanges on said retainer during the entire sequence of installing the axle shaft.

45. (New) A tone ring assembly for use on a rotatable machine part, said assembly including a rotatable tone ring able to generate a voltage output by rotation and a magnetic sensor assembly disposed in facing relation and closely spaced from said tone ring, said rotatable machine part including an axially inner portion and an axially outer portion running in a surrounding bearing unit and with oil leakage being resisted by an oil seal, said tone ring comprising an axially extending main body portion with a plurality of lands and grooves, which generate a voltage output upon rotation, and a radially extending flange at one end of said tone ring, a retainer having axially inner and outer radial flanges to prevent substantial axial movement of said tone ring, and a spacer lying between said radially extending flange on said tone ring and said axially outer radial flange of said retainer, said tone ring including a plural radially extending ribs on its inner diameter for snugly engaging a shaft, the spaces between said ribs affording passages for allowing oil to pass axially through said tone ring.

46. (New) A tone ring assembly as defined in claim 45, which further includes a groove in said tone ring body lying between said flange and the remainder of said body, said groove receiving one of said axial flanges of said retainer and preventing axial movement of said body.

47. (New) A tone ring assembly as defined in claim 45, wherein said body portion of said tone ring and said retainer are so sized that, upon installation of said retainer in the application counterbore, said body portion is supported by said retainer, and presents an opening in the inside diameter thereof that is able to be aligned without additional aid with an axle shaft which is to be inserted therethrough.

48. (New) A tone ring assembly for use on a rotatable machine part, said assembly including a rotatable tone ring able to generate a voltage output by rotation and a magnetic sensor assembly disposed in facing relation and closely spaced from said tone ring, said rotatable machine part including an axially inner portion and an axially outer portion running in a surrounding bearing unit and with oil leakage being resisted by an oil seal, said tone ring comprising an axially extending main body portion with a plurality of lands and grooves able to generate a voltage output upon rotation, and a radially extending flange at one end of said tone ring, a retainer having axially inner and outer radial flanges to prevent substantial axial movement of said tone ring, said tone ring including means permitting passage of oil axially along said tone ring as well as means for engaging an axle shaft to locate said tone ring on said axle shaft, said engaging means

allowing said axle shaft and said tone ring to become more strongly adherent when said tone ring is exposed to an oily condition.